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ABSTRAK

Artikel ini membahas peran kecerdasan buatan (AI) dalam memperkuat bahasa Inggris sebagai *lingua franca* global, khususnya di bidang sains, teknologi, dan pendidikan. Dengan menggunakan pendekatan deskriptif kualitatif, studi ini meneliti bagaimana teknologi AI, seperti *Natural Language Processing* (NLP) dan *Neural Machine Translation* (NMT), memfasilitasi komunikasi lintas budaya dan meningkatkan pembelajaran bahasa. Alat berbasis AI seperti *Google Translate*, *Grammarly*, *Duolingo*, dan *Chatbot* menjadi contoh utama bagaimana teknologi ini meningkatkan aksesibilitas, akurasi, dan efisiensi dalam menguasai bahasa Inggris. AI membantu pembelajar mengatasi hambatan bahasa dengan menyediakan penerjemahan *real-time*, koreksi tata bahasa, serta pengalaman belajar yang dipersonalisasi. Hasil penelitian menekankan pentingnya pengembangan AI yang etis, inklusif, dan bertanggung jawab agar AI tidak hanya memperkuat peran bahasa Inggris sebagai bahasa global tetapi juga menjaga keragaman bahasa dan budaya di dunia. Pendekatan interdisipliner menunjukkan potensi AI dalam mendorong komunikasi yang adil, berkelanjutan, dan inklusif secara global. Dengan menyeimbangkan kemajuan teknologi dan pelestarian budaya, AI dapat memberdayakan berbagai komunitas, mengurangi kesenjangan bahasa, serta mendukung kolaborasi global. Penelitian ini menekankan perlunya inovasi berkelanjutan dalam AI sambil tetap menghormati identitas budaya dan bahasa untuk menciptakan lingkungan komunikasi global yang harmonis.

Kata Kunci: Artificial intelligence, *Lingua franca*, *Natural Language Processing*, *Neural Machine Translation*.

ABSTRACT

This article explores the role of artificial intelligence (AI) in strengthening English as a global *lingua franca*, particularly in the fields of science, technology, and education. Using a descriptive qualitative approach, the study examines how AI technologies, including *Natural Language Processing* (NLP) and *Neural Machine Translation* (NMT), facilitate cross-cultural communication and enhance language learning. AI-powered tools such as *Google Translate*, *Grammarly*, *Duolingo*, and *Chatbots* are prime examples of how these technologies increase accessibility, accuracy, and efficiency in mastering English. AI supports learners in overcoming linguistic barriers by providing real-time translation, grammar correction, and personalized learning experiences. The findings highlight the importance of developing AI in an ethical, inclusive, and responsible manner to ensure it not only strengthens English's role as a global language but also preserves the world's rich linguistic and cultural diversity. An interdisciplinary approach shows AI's potential to foster equitable, sustainable, and inclusive communication worldwide. By balancing technological advancement with cultural preservation, AI can empower diverse communities, reduce language gaps, and support global collaboration. This research underscores the need for continuous innovation in AI while respecting cultural and linguistic identities to create a harmonious global communication environment.

INTRODUCTION

Artificial intelligence (AI) technology is now an important part of many aspects of life, including linguistics and language technology. Simply put, AI is the ability of machines to mimic the way humans think, learn and make decisions. In the language world, AI uses a technology called Natural Language Processing (NLP) to understand, analyze, and generate human language. This technology is the basis for the development of applications such as automatic translators and virtual assistants.

AI plays a major role in strengthening English as the primary language of global communication. NLP technology helps process large amounts of information quickly and effectively, further cementing English's position as a key language in science and technology. Tools like Grammarly, Duolingo, and chatbots are also changing the way we learn languages. With features that provide immediate feedback and customized learning experiences, these tools are making learning easier.

One example of the successful application of AI in language is Google Translate. The service now uses neural networks to understand the context of sentences and produce more accurate translations than older methods. This makes AI-based translation tools an important element in cross-language communication. Research conducted by (Alifa et al. 2024) showed that 73% of users were satisfied with the accuracy of the tool, which helped to facilitate global communication using English.

(Groenewald et al. 2024) also highlight the growing role of AI in linguistics, focusing on its applications in language acquisition and analysis. Their research outlines how AI is increasingly being used in linguistics to enhance language learning and improve the understanding of linguistic structures. This further supports the integration of AI technologies like NLP in making language learning more accessible and effective.

Furthermore, Ramirez & Fuentes Esparrell (2024) note that AI is playing an increasingly important role in education, helping to create the perfect synergy for learning by providing more personalized and interactive experiences. This further supports the integration of AI technologies in language education, making language learning more efficient and enjoyable.

However, the application of AI in linguistics also faces challenges. (Rugaiyah, 2023) highlighted that while AI can improve language skills through adaptive learning, over-reliance on this technology can reduce deep understanding of language structure. In addition, (Xu et al. 2021) cautioned that data privacy is becoming a serious issue in AI applications, especially in a highly connected digital world.

This research aims to see how AI and linguistics can support each other, and how these technologies can maximize the role of English in the world of science and technology. It will also discuss the ethical challenges and language diversity issues that arise in the application of AI in the field of linguistics.

RESEARCH METHODOLOGY

This study uses a descriptive qualitative approach, which is well-suited for exploring complex relationships and providing in-depth insights into the interplay between artificial intelligence (AI) and linguistics, particularly in the context of English as a global lingua franca in science and technology. Additionally, the study incorporates a literature review to gather and analyze various theoretical and empirical sources, providing a strong foundation for understanding the role of AI technology in supporting cross-cultural communication and

language learning. This approach is rooted in the understanding that qualitative research allows for subjective interpretation and analysis of patterns within specific contexts (Creswell, 2014). The data used in this study includes primary sources such as recent scholarly articles by Alifa et al. (2024), Xu et al. (2021), and Rugaiyah (2023), and secondary sources like linguistic theory books, technology books, and documentation from AI-based applications such as Google Translate, Chatbots, and Grammarly.

Data collection was conducted through a literature review and comparative analysis. The literature review involved gathering relevant studies from academic databases like Google Scholar, ResearchGate, and ScienceDirect, following Snyder (2019) approach to systematizing literature reviews for exploring research gaps and emerging trends. Comparative analysis was also conducted on various AI-based applications to evaluate their effectiveness, challenges, and opportunities in supporting English language usage. The collected data were analyzed thematically, using Braun and Clarke's (2019) reflexive thematic analysis framework, which emphasizes flexibility and critical engagement in identifying relevant patterns and themes. This process included categorizing recurring themes, conducting critical analysis, and comparing case studies to uncover deeper insights into the interaction between AI technology and linguistic applications.

To ensure the validity and reliability of the findings, the study utilized data triangulation, combining multiple sources and methods to corroborate results and minimize bias (Flick, 2018). Additionally, the research adhered to ethical principles by using credible and properly cited sources, ensuring the privacy and security of data, and following academic guidelines to maintain integrity. By employing this methodology, the study aims to provide a comprehensive understanding of the synergy between AI and linguistics, while also addressing the challenges and opportunities of using AI to support English as a global lingua franca.

RESULT AND DISCUSSION

This section aims to explore the relationship between Artificial Intelligence (AI) and linguistics, particularly in the context of English's role as a global connector in science and technology. Key concepts and previous research findings form the foundation of this discussion, with a focus on AI tools such as Google Translate, Grammarly, Duolingo, and Chatbots.

The Role of AI in Linguistics

Artificial Intelligence (AI) has revolutionized the way linguistic analysis is conducted through Natural Language Processing (NLP) technology. This technology allows machines to understand the structure, context and meaning of human language with an accuracy that is increasingly approaching human capabilities. In its development, NLP relies on the theory of Computational Linguistics popularized by Noam Chomsky. This theory emphasizes the importance of grammar and sentence structure in building better language processing systems (Jurafsky & Martin, 2018).

Study by Groenewald et al. (2024) also notes that the application of AI in linguistic research is not limited to translation and language learning, but also includes language acquisition analysis. This further strengthens the role of AI in accelerating the language learning process and facilitating a deeper understanding of linguistic structures.

One of the most prominent NLP applications is Google Translate. It uses neural networks that allow the machine to understand the communication intention of text, rather than just translating words literally. This improves the accuracy and relevance of the translation compared to traditional rule-based or statistical methods. According to (Xu et al. 2021), NLP also plays a major role in big data analysis, allowing scientists to sift through and process



scientific information efficiently, with English as the primary tool for global communication in science and technology.

In addition, NLP has been used to create other AI-based applications, such as chatbots and automated text analysis. Chatbots use NLP to interact with humans in a natural conversation, providing relevant responses and creating a more interactive communication experience. Another example is the use of NLP for sentiment analysis in social media, which helps organizations understand public opinion more deeply.

Furthermore, NLP also enables the creation of tools that support linguistic education. For example, Grammarly uses NLP to provide immediate feedback on grammar, spelling, and writing style. This tool not only helps users improve their language skills but also saves time and effort by automating the correction process (British Council, 2023).

However, the use of NLP is not free from challenges. Reliance on big data can raise privacy concerns, while the limitations of AI algorithms in understanding cultural nuances and context remain a significant obstacle. This points to the need for further development to overcome these challenges while improving the accuracy and reliability of NLP technology (Lo, 2023).

English as Lingua Franca

English has long been considered the primary language of international communication, science and technology. This position is reinforced by English's role as a universal language in conveying scientific and technological knowledge around the world. Jenkins (2015), in her theory Global Englishes, emphasizes that the global spread of English as a lingua franca is shaped not only by historical and socio-political factors but also by its adaptability to diverse cultural and linguistic contexts, facilitated by modern technologies.

In the context of science and technology, English is often used as the standard in scientific publications and academic communications. (Alifa et al. 2024) found that 73% of users of AI-based translation tools, such as Google Translate, found them to be very effective in bridging intercultural communication. This suggests that AI-based tools have become an important element in supporting English as a global lingua franca.

Furthermore, (Xu et al. 2021) emphasize that the ability of AI-based technologies to analyze and sift through big data has strengthened the dominance of English in science. For example, platforms such as Grammarly and AI-based voice assistants, such as Siri and Alexa, use English as the default language, reinforcing its use globally.

However, this dominance of English also presents challenges. One concern is that other languages may be marginalized, creating an imbalance in cultural and linguistic representation. According to Jenkins (2015), it is crucial to embrace an inclusive approach to the use of English, recognizing and accommodating the diverse forms of 'Global Englishes' spoken around the world, rather than adhering strictly to standardized norms.

AI Technology for Language Learning

Advances in artificial intelligence (AI) technology have revolutionized the way we view and implement language learning. With the advent of personalized and adaptive learning systems, AI allows for a more flexible and tailored approach to individual needs. (Rugaiyah 2023) notes that this technology enables learning that is responsive to individual needs, increasing students' confidence in communicating.

According to Ramirez & Fuentes Esparrell (2024), the application of AI in education creates opportunities to provide more effective and engaging learning experiences. With AI-based tools, language learning can be better tailored to meet the individual needs of each student, accelerating the language acquisition process.

One relevant app is Grammarly, which provides instant feedback on grammar mistakes, sentence structure, and word choice. This tool helps learners to correct their mistakes while

providing explanations of relevant language rules, thus deepening their understanding. In addition, platforms such as Duolingo use an AI-based gamification approach, which dynamically adapts the difficulty of the lesson to the user's ability, making it engaging and interactive (British Council, 2023).

AI also plays an important role in realistic conversation simulation. With Natural Language Processing (NLP) technology, AI-based chatbots such as ChatGPT can simulate conversations in various contexts, such as daily interactions or business scenarios, allowing learners to practice interactively without social pressure (Jurafsky & Martin, 2018).

Lo's research (2023) explains that neural machine translation (NMT) technology enables more accurate automatic translation by better understanding language context. With NMT, learners can access cross-language learning materials without geographical restrictions, providing them with wider learning opportunities. It also strengthens students' ability to understand English as a global lingua franca (IEEE Xplore, 2024).

Kumar's research (2023) showed that more than 85% of students who used chatbots or AI-based applications found language learning to be more engaging and efficient than traditional methods. In addition, AI supports the analysis of learning data to provide personalized recommendations, allowing learners to focus on areas that require more attention.

Furthermore, technologies such as virtual reality (VR) and augmented reality (AR) have been utilized to create immersive learning environments. In these AI-based simulations, learners can experience real-life situations, such as shopping or job interviews, which provide practical experience in the context of the target language. With these developments, AI is able to make learning interactive, relevant and contextualized for learners.

Challenges in the Application of AI to Linguistics

While artificial intelligence (AI) technology offers various benefits in linguistic learning, its application also presents a number of significant challenges. One of the main challenges is the issue of data privacy and security. (Xu et al. 2021) note that AI-based tools, which collect and analyze user data to customize learning experiences, often face the risk of personal data leakage. In language learning, data such as learning habits, preferences, and communication patterns of users can be exposed without proper management.

In addition, over-reliance on AI tools can decrease deep understanding of more complex language structures. AI often relies on statistical algorithms that do not fully understand the cultural and social context of human language. For example, AI-based chatbots may not be able to capture nuances of humor or idioms that are often influenced by local culture (Jurafsky & Martin, 2018).

(Rugaiyah 2023) also highlights that while AI can accelerate linguistic learning, unwise use can cause learners to lose a sense of autonomy in their learning process. This is in line with the Technological Determinism theory which states that technology not only shapes human behavior, but also limits the way they think and communicate.

Another challenge is algorithm bias in AI technology. According to (Lo 2023), AI often exhibits biases based on the training data used, which can affect the accuracy and fairness of results. In the linguistic context, these biases can lead to the neglect of minority languages or dialect variations, thus exacerbating inequalities in technology access.

Lack of inclusivity for minority languages is also an important issue. Most AI-based tools are designed for languages with rich digital resources, such as English or Mandarin, so languages with limited resources are often overlooked (British Council, 2023). According to (IEEE Xplore 2024), technologies such as neural machine translation need to be developed to support more minority languages to make AI more inclusive.

To address these challenges, there needs to be investment in the development of algorithms that are more adaptive to cultural and social contexts, as well as the implementation

of strong ethical protocols in the use of user data. Interdisciplinarity between linguistics and computer science can also encourage the development of more inclusive and responsible technologies in the future.

AI tools like Grammarly, Duolingo, and Chatbots have made learning English more effective and accessible. These tools not only provide instant corrections and feedback but also offer a more interactive and adaptive learning experience, making it more engaging and valuable for learners around the world.

Results

In this study, several articles used as references provide important insights into the role of artificial intelligence (AI) technology in the development of linguistics, particularly in the context of language learning and global communication. These articles can be compared to explore their strengths and weaknesses, as well as their contributions to a deeper understanding of AI in linguistics.

a. Alifa et al. (2024) Artificial Intelligence Meet Language as Technology Advances in Translation Tools

Strengths:

The article by Alifa et al. (2024) provides strong empirical evidence on the effectiveness of AI-based tools in accelerating the language learning process, particularly in the context of translation using Neural Machine Translation (NMT) technology. This study highlights how AI-powered translation tools, such as Google Translate, have revolutionized language translation by significantly improving accuracy and bridging language barriers. According to the research findings, about 73% of users expressed satisfaction with the accuracy of these translation tools, which demonstrates their success in real-world applications.

One of the key strengths of this article is its emphasis on how AI contributes to cross-cultural communication. In an increasingly connected world, the ability to communicate effectively across language and cultural differences has become crucial. AI-based translation tools help facilitate this process, making communication between individuals from different cultural and linguistic backgrounds easier. This is especially relevant in the context of English as a global lingua franca, where English serves as the primary medium of international communication in fields such as academia, business, and diplomacy. By enhancing the speed and accuracy of translations, AI allows non-English speakers to engage in more meaningful and effective communication.

Weaknesses:

While this article strongly emphasizes real-time translation using AI technology, it does not explore the broader impact of AI usage, such as how this technology affects the overall language learning process. The research focuses more on language translation in practical contexts rather than on the pedagogical aspects and the sustainability of using AI in language education. For instance, the long-term impact of AI tools in language teaching—including how they change the way people learn languages and their reliance on technology—is not deeply explored. Additionally, the article does not address how automated translation might affect a deeper understanding of language structures and culture, which are critical components of the language learning process.

b. Rugaiyah (2023) The Potential of Artificial Intelligence in Improving Linguistic Competence: A Systematic Literature Review

Strengths:

The article by Rugaiyah (2023) provides valuable insights into how the use of artificial intelligence (AI) can accelerate and enhance the quality of language learning, particularly through the adoption of adaptive learning technology. Adaptive learning technology allows



learning tools to adjust the content and level of difficulty according to each student's abilities and needs. This ensures that each learner can progress at their own pace, avoiding frustration that may arise if the material is too difficult or too easy. As a result, this technology enables a more efficient learning experience that is focused on developing the necessary skills, which is especially important in the context of language learning.

One of the key advantages highlighted in this article is how AI can create a more personalized and engaging learning experience. By providing instant feedback, AI can motivate students to continue learning and improving their skills without feeling overwhelmed. Tools such as Duolingo or Babbel, which use AI to tailor lessons to the student's ability, demonstrate how this technology can make language learning more interactive and engaging. Rugaiyah also emphasizes that this personalized learning experience not only helps students achieve their learning goals but also increases their engagement, which in turn accelerates the learning process.

Furthermore, this technology helps improve accessibility for various groups of students. For instance, AI-based applications that offer real-time corrections allow language learners to study independently, wherever they are, reducing reliance on traditional teaching or limited access to teachers. This opens up opportunities for individuals who may not have easy access to formal educational institutions or more expensive language learning programs.

Weaknesses:

However, while this article presents the great potential of AI in language learning, there are several shortcomings that need to be addressed. One of these is the lack of in-depth discussion on the ethical challenges that arise with the use of AI in education. A major issue that is not explored in detail is user data privacy. Many AI-based learning applications collect personal data and learning behaviors of students to tailor the learning material. While this can enhance the learning experience, the collection and storage of personal data raises concerns about data security and the potential misuse of this information.

Additionally, the article does not adequately address the potential for excessive dependency on technology in language learning. Students who rely too heavily on AI-powered tools may lose the ability to think critically or solve problems independently. For example, they may depend on applications to translate or correct their mistakes without understanding the underlying structure or logic of the language. This could hinder the development of comprehensive and deep language skills, which are crucial for long-term language learning success.

c. Xu et al. (2021) Artificial intelligence: A powerful paradigm for scientific research

Strengths:

The article by Xu et al. (2021) provides a comprehensive analysis of how artificial intelligence (AI), particularly in the form of Neural Machine Translation (NMT) and big data analysis, strengthens the role of English as a global language in the fields of science and technology. This research offers deep insights into how AI is used to process and analyze vast amounts of data, enabling more efficient communication and collaboration across the globe, especially in the scientific field.

In the global scientific community, language barriers often limit access to research, data, and international partnerships. AI technologies like NMT have proven extremely helpful in bridging these language gaps. With the ability to provide real-time translations that understand context, NMT allows scientists from different countries to share knowledge and collaborate without being hindered by language differences. This is especially important in scientific communication, where precision and accurate understanding are crucial. AI not only improves access to scientific information but also allows researchers from all over the world to contribute to global research in a more integrated way.

This research also highlights how AI, through big data analysis, speeds up the process of managing and analyzing large-scale information. In the world of science, handling and analyzing massive data can often be a difficult and time-consuming task. With the help of AI, this big data analysis can be done more quickly and accurately, allowing researchers to identify patterns, insights, and correlations that were previously hard to detect, which, in turn, enhances productivity and scientific collaboration.

Weaknesses:

However, while this article provides valuable understanding of AI's role in the scientific and technological world, there are several weaknesses that should be noted. One of them is that the research focuses more on AI's role in the scientific and technological realms but less on exploring the social and cultural implications of using AI in language learning. For instance, although technologies like NMT can improve language accessibility in scientific communication, this research does not discuss how these technologies might affect how people learn and use language, both in academic and professional contexts.

Additionally, the article does mention challenges related to privacy and data security, but it does not provide concrete solutions to address these issues. In today's digital age, the use of AI involving big data processing and automated translation requires careful management of data to protect personal information and maintain user trust. Without a clear approach to addressing data security issues, the use of AI in science and technology may raise larger concerns regarding privacy and the potential misuse of information.

Analysis and Synthesis of Findings

Based on a thorough analysis of the existing articles, it can be concluded that while each study provides valuable contributions to understanding the role of artificial intelligence (AI) in linguistics, there are several gaps that need to be addressed. Each article focuses on different aspects and offers unique perspectives on the use of AI in language communication.

Alifa et al. (2024) provides clear evidence on the effectiveness of AI translation, particularly through the use of Neural Machine Translation (NMT) to overcome language barriers, enabling more efficient cross-language communication. This study highlights the significant potential of automated translation in improving the global accessibility of information. However, the study is more focused on translation and does not explore how this technology interacts with language learning in a broader context, such as changes in how we understand language structure or its influence on cognitive abilities in language learning.

On the other hand, Rugaiyah (2023) emphasizes the importance of adaptive learning technology in enhancing the language learning experience. With AI adapting lesson content to the individual's abilities, students can learn more effectively and according to their needs. Rugaiyah's emphasis on personalization in learning is critical, as it allows for a more holistic approach that aligns with students' developmental dynamics. However, this study falls short in addressing the ethical impact of AI, such as user data privacy, which is crucial in an increasingly digital and technology-dependent learning environment.

Meanwhile, Xu et al. (2021) focuses on AI's role in big data and science, showing how AI can enhance the use of English as a global lingua franca in international scientific collaboration. AI facilitates the fast and accurate analysis of large data sets, accelerating scientific discoveries and global partnerships. This research presents how AI in big data opens up significant opportunities for accelerating global communication and research. However, despite the great benefits of AI in science and technology, the article does not sufficiently explore the social and cultural implications of using AI in language learning, as well as its reliance on dominant languages (such as English and Mandarin), which may lead to the marginalization of other languages.

While AI offers numerous benefits in overcoming language barriers and enhancing accessibility, there are several major challenges that need attention. One of the primary concerns is the issue of user data privacy. Many AI tools, such as Google Translate and Grammarly, collect personal data and user behavior to improve their performance. This raises concerns about how this data is used and protected, as well as who has access to this personal information. If not carefully managed, data misuse could lead to serious privacy violations.

Additionally, dependency on technology is another issue that needs to be addressed. Users who become overly reliant on AI-based tools in language learning may lose the ability to deeply understand and analyze language. For example, if a learner solely depends on Grammarly to check grammar mistakes, they may not understand the underlying grammar principles causing those mistakes. This can hinder the development of a more holistic language skillset, especially in understanding the social and cultural context that influences language use.

Algorithmic bias is another significant issue. Many AI systems, including automatic translation, are trained on data predominantly from languages with more resources (such as English or Mandarin). This results in the marginalization of minority languages that lack sufficient digital data for training. As a result, AI algorithms tend to be less accurate when handling less common languages, exacerbating the inequality of information access for minority language communities. This can widen the gap in access to education and information, especially for individuals who do not speak dominant languages.

Overall, while the existing articles provide valuable insights into the potential of AI in enhancing language communication, these challenges need to be addressed in more depth. To maximize the benefits of AI in linguistics, it is essential to develop solutions that address privacy concerns, reduce dependency on technology, and mitigate algorithmic bias that may marginalize lesser-known languages. Additionally, the social and cultural aspects of using AI in language learning should be further explored to ensure that this technology is used in a fair and inclusive manner for all stakeholders.

Discussions

The Role of AI Technology in Strengthening English as a Lingua Franca

The findings reveal that AI, through technologies such as Natural Language Processing (NLP) and Neural Machine Translation (NMT), has strengthened the position of English as a global lingua franca. This is supported by user satisfaction levels with tools like Google Translate (73% satisfaction), demonstrating AI's effectiveness in facilitating cross-cultural communication. This indicates that AI technology has made a significant contribution to bridging language gaps, particularly in science and technology, where English serves as the primary standard.

Jenkins' theory (2015), introduces an inclusive approach to communication, where English is used by speakers from various linguistic backgrounds for global purposes, without adhering strictly to standardized norms.. In the digital age, AI technologies have significantly bolstered this dominance by providing tools that facilitate seamless cross-cultural interactions. Google Translate, a prime example, employs neural networks to not only translate words but also understand their contextual meaning, resulting in translations that are more accurate and culturally relevant (Jurafsky & Martin, 2018). This shift from literal translations to context-based understanding enhances global communication by minimizing misunderstandings caused by language barriers.

AI also plays a key role in cementing English's position as the default language for global discourse in science, technology, and commerce. Smart devices and virtual assistants such as Siri and Alexa rely on English as their primary mode of communication, embedding the language into the fabric of daily life for users worldwide. This widespread adoption not only



reinforces the prevalence of English but also provides non-native speakers with regular exposure and opportunities to practice the language in real-life contexts.

Many AI tools are trained predominantly on datasets from resource-rich languages like English, leaving smaller languages underrepresented and underserved. To counter this, algorithm development must prioritize inclusivity by incorporating multilingual data and focusing on creating tools that respect and preserve linguistic diversity. For instance, advancements in Neural Machine Translation (NMT) could be tailored to include lesser-known languages, ensuring that all linguistic communities benefit from technological progress.

Ethical Implications and Limitations of AI Technology

The findings indicate that AI holds significant potential to expand the accessibility of language learning, but further development is needed to address ethical and technical challenges. Ensuring the sustained positive impact of AI requires collaboration between linguists, technology developers, and policymakers. For example, algorithms like NMT can be enhanced to support underrepresented languages, thereby reducing linguistic inequality.

The reliance of AI on extensive datasets has brought immense benefits, but it also raises significant ethical concerns, particularly around user privacy and data security. (Xu et al. 2021) emphasize the critical need for robust protocols to protect user information. AI-powered tools like Grammarly and Google Translate analyze vast amounts of personal data, including writing habits, communication styles, and preferences, to deliver personalized services. However, without strict safeguards, this data is susceptible to breaches, misuse, or unauthorized exploitation, posing risks to user privacy in an increasingly connected digital world.

Another pressing issue is algorithmic bias, which (Lo 2023) identifies as a significant limitation of current AI technologies. AI models are often trained on datasets dominated by languages like English and Mandarin, leading to inequitable representation of minority languages. This bias creates a digital divide, where languages with fewer resources receive inadequate support, exacerbating existing inequalities. For example, Google Translate is highly accurate for widely spoken languages but struggles to deliver reliable translations for less commonly used dialects, limiting the accessibility and inclusivity of AI technology.

To address these challenges, a collaborative approach that involves linguists, computer scientists, and ethicists is essential. Ethical frameworks must be established to ensure that AI prioritizes fairness, transparency, and inclusivity. For instance, developers could implement features that allow users to control how their data is used and stored, fostering trust and accountability. Furthermore, increasing the representation of under-resourced languages in training datasets would help reduce bias and make AI tools more equitable.

These limitations highlight the importance of not only advancing AI's capabilities but also ensuring that its applications align with ethical standards and social responsibilities. By addressing these concerns, AI can be developed as a tool that supports linguistic equity while maintaining user trust and privacy.

The Benefits of AI for Language Learning and Accessibility

The findings also highlight that AI has revolutionized language learning through adaptive and personalized approaches. Tools like Duolingo and Grammarly use algorithms that adjust the difficulty level of materials based on users' abilities, creating a more engaging and effective learning experience. For instance, Duolingo's use of gamification makes the learning process more interactive, while Grammarly helps users improve their writing skills by providing instant feedback.

AI has revolutionized language learning by making it more accessible, personalized, and practical. Tools like Grammarly have become indispensable for learners aiming to improve their writing skills. With instant feedback on grammar, spelling, and sentence structure, Grammarly helps users identify errors and learn from them, fostering better writing habits. By

automating corrections and explanations, the tool reduces dependence on human instructors, allowing learners to progress at their own pace (British Council, 2023).

Duolingo offers another example of how AI transforms education. By incorporating gamification and adaptive learning algorithms, Duolingo ensures that lessons are tailored to each learner's progress and abilities. This approach not only keeps learners engaged but also helps them retain information more effectively. The app's reward system, which encourages consistent practice, has made learning English more enjoyable and achievable for millions worldwide.

In addition to these tools, immersive technologies like Virtual Reality (VR) and Augmented Reality (AR) have opened new avenues for language acquisition. VR simulations allow learners to practice real-life scenarios such as job interviews, travel situations, or business meetings in a safe and controlled environment. These interactive experiences not only build confidence but also develop practical communication skills that are essential for real-world applications. AR, on the other hand, overlays language learning content onto physical environments, enabling learners to engage with their surroundings in the target language.

AI-powered conversational agents like ChatGPT and language-specific chatbots have further enhanced accessibility. These tools simulate natural conversations, allowing learners to practice speaking and listening without the fear of judgment. By offering immediate feedback and context-aware suggestions, they help users refine their language skills while building fluency and confidence.

Moreover, AI has improved accessibility for learners with disabilities. Speech-to-text and text-to-speech technologies enable students with hearing or visual impairments to participate fully in language learning. For example, AI can convert spoken words into text for hearing-impaired learners or provide audio descriptions for visually impaired users, ensuring inclusivity in education.

Through these advancements, AI has made English learning more interactive, effective, and accessible to diverse populations. By combining traditional teaching methods with innovative technology, AI not only enhances language proficiency but also equips learners with the skills needed for success in academic, professional, and personal contexts.

CONCLUSION

This study demonstrates that artificial intelligence (AI) plays a significant role in strengthening English as a global lingua franca, particularly through technologies such as Natural Language Processing (NLP) and Neural Machine Translation (NMT). The findings indicate that AI-based tools, such as Google Translate, Grammarly, Duolingo, and chatbots, enhance accessibility, accuracy, and efficiency in mastering English. With 73% of users expressing satisfaction with AI-based translation tools, this technology proves effective in facilitating cross-cultural communication and bridging language gaps, particularly in the fields of science and technology.

However, the findings also reveal several important challenges that need attention, such as the potential threat to data privacy and the over-reliance on technology, which could reduce a deeper understanding of language structure. Additionally, the algorithmic bias in AI, which favors languages with large digital resources such as English and Mandarin, presents an issue that affects equitable access to minority languages. Therefore, the development of more inclusive algorithms and solutions related to data privacy is necessary to ensure the fair and sustainable use of AI.

To maximize the benefits of AI in linguistics, collaboration between linguistics, technology, and policymakers is essential. The development of algorithms that support underrepresented languages will help reduce linguistic inequality. Moreover, it is crucial to



preserve linguistic and cultural diversity worldwide by adopting an ethical and inclusive approach to the use of AI technology.

AI holds great potential to strengthen the role of English as a global language and enhance language learning. However, it must be accompanied by continuous innovation and proper ethical management to ensure that this technology functions effectively and inclusively for all communities.

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